

# COMPUTERWORLD

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Robert Dodson (right) discusses his computer project with J.H. Hudgins, Chicago division vice-president of CIT Credit Corp. The black metal case (center) will house the new computer. Dodson's first computer (right foreground) will be incorporated into it.

## Youth Building Computer With 8,192-Word Memory

CHICAGO — Robert Dodson, 17, is building at home a computer with an 8,192 12-bit memory.

Just one year ago he started making his first computer, a simple calculator. It won a first prize in the Illinois State Science Fair at the University of Illinois last May.

This month, Dodson, a June graduate of Mendel Catholic High School, was awarded the C.I.T. National Achievement Scholarship, a four-year scholarship to the college of his choice.

### Among Top 110

Dodson is among the nationwide group of 110 top Negro scholars whose scholarships provide up to \$1,500 a year for four years.

He will go to the Illinois Institute of Technology and will major in computer sciences.

He has already advanced well beyond the first-prize computer he built a year ago. That, he explains, was merely a single-step calculator. In order to make that computer automatic, he had to increase its memory to store at least two program steps. So last summer, he built a second computer and added it to the first to increase its memory capacity to six program steps and also to house the controls needed to make it automatic.

It worked, but he still wasn't satisfied. It was just too limited, he said.

Dodson is building a

much more sophisticated and complex computer and the Dodsons' dining room virtually has been converted to a laboratory.

An oscilloscope is on loan from the school. He has purchased some of the other testing equipment and units from government surplus.

### Uses Integrated Circuits

Where his first computers used electromagnetic relays, his new machine uses integrated circuits that will increase its speed roughly 10,000 times.

It is designed to be capable of performing all computer functions. In essence, it will be at the same level of sophistication as today's small commercially

(Continued on page 4)

## Programmatics Renews Its Effort To Get Injunction Against IBM

NEW YORK — Apparently using IBM's unbundling announcement as new evidence, Programmatics has renewed its efforts to stop IBM from continuing to distribute its 483 Sort free.

The software company has asked the Second Circuit Federal Court of Appeals to reverse the June 6 decision by Federal District Judge Edward C. McLean which denied Programmatics a temporary injunction against IBM.

Programmatics contends the free distribution of the 483 Sort is damaging the market for Programmatics' Pi Sort.

IBM's unbundling announcement demonstrates that separate pricing is feasible, a Programmatics spokesman said. Yet IBM is continuing its old tie-in practices by not charging for the 483 Sort, he added.

IBM has said it will not charge for any software released before its unbundling announcement.

## SBC Cancels 360 DataText

NEW YORK — The marketing of Call/360 DataText was halted last week and the Service Bureau Corp. will terminate the service Oct. 31.

The IBM subsidiary would say only that the move was based on the company's continuing evaluation of its business and services.

The announcement threw DataText users into a tizzy but brought a delighted response from Joan Van Horn, who had been conducting a one-woman battle against the service. Her

company, VIP Systems in Washington, D.C., offers a DataText-compatible text-editing system (see page 16).

However, one user expressed the fear that VIP wouldn't be able to handle all of the current SBC customers.

### Underpriced?

IBM first offered Call/360 DataText last spring. Miss Van Horn charged that IBM had gone into competition with her in violation of the 1956 consent

decree, was offering the service at an unreasonably low price, and refused to supply her with the software so that she could update her own service.

She stirred up quite an uproar, and, in September, IBM announced it would make the Call/360 DataText software available to its customers. But the controversy continued, and in January IBM shifted its information marketing division and all of its time-sharing services to the SBC.

## Controller Acts Like Tape Unit

By Peter L. Briggs  
CW Staff Writer

WESTBURY, N.Y. — A telecommunications controller that is S/360 compatible and operates exactly as if it were a tape drive has been announced here by Compat Corp. The unit, intended to replace the IBM 2701 communications controller, allows the user to access his remote devices through any of the high-level languages supported on the S/360 under any operating system and requires far less core than S/360 telecommunications techniques.

The unit, the Compat 270, offers several times the speed and capability of the equivalent 2701, according to the manufacturer. While the 2701 can handle only four low-speed (180 bits/sec) lines simultaneously, the 270 can operate with up to 96 low-speed lines. The 2701 can operate with four high-speed

(230,400 bits/sec) lines, while the 270 can handle up to 22 high-speed lines.

### Certainly More Expensive

Prices for the 2701 range from about \$9,400 up to a maximum of several times that price (the actual maximum price is not readily available from IBM). The 270 price ranges from \$70,000 to \$150,000, and the unit is also available for lease. The price range of the 270 actually makes

it price competitive with the IBM 2703 transmission control unit (for which the prices start at \$67,000). The maximum configuration for the 2703 allows connection of 176 low-speed lines or up to 24 high-speed lines.

### 2703 Has Comparable Features

The 2703 and the 270 have extremely similar features, including the use of automatic call

(Continued on page 4)

## 2314 System Now Comes Piecemeal

WHITE PLAINS, N.Y. — IBM's 2314 disk storage system, now available only in packages of five and nine drives, will be available next year in any combination from one to nine drives.

This will enable the user to increase the number of drives as

his needs grow, IBM said.

A 2314 with one drive will rent for \$2,015 a month and sell for \$90,940. Each drive has a capacity of 29,176,000 bytes.

First shipments will be scheduled for the third quarter of 1970, IBM said.

## Software Builds Custom Edit Routines

LOS ANGELES — A new S/360 proprietary software system is designed for the generation of custom-tailored editing programs that can act as front ends to any existing program. Called Edit-Program Generator-II (EPG-II), the system is available from Computer

Sciences Corp.

"EPG-II eliminates most of the cost associated with the writing of edit programs, and enables the preparation of complete editing programs for a complex data set in a couple of hours," according to Roger M. Fisher, general manager of the company's application systems division.

The program should make it possible to eliminate almost all input data errors, CSC said. Fisher pointed out that because most edit programs are written under extreme pressure, the speed and simplicity of the package should generate large cost savings for the user.

Originally developed at Plante & Morgan, a Detroit-based CPA firm, in conjunction with CSC, the system has been widely tested in the field, according to the company.

EPG-II consists of a specialized compiler that accepts five-character mnemonic codes and

produces standard S/360 languages. These mnemonics define the files, record types, editing required, reference information for tables and files, and can be used to specify new error-messages.

The system sells for \$6,000 and operates under either the Operating System or Disk Operating System on the S/360.

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Get 2311 Compatibility

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## PanAm Using Small-Screen Terminals

Pan American World Airways control agent Robert Weber uses a CRT terminal at Kennedy International Airport, New York, to retrieve plane loading data. PanAm has ordered 190 of the Bunker-Ramo 2212 terminals for use in seven other passenger terminals.

## Unbundling Can Save Users 30%: Berlent

NEW YORK — "Computer users who fear their EDP costs may increase up to 25% as a result of the IBM unbundling should stop worrying and start planning," says Harvey N. Berlent, president of the Computer Exchange, Inc. "They may be able to save up to 30%."

"IBM has opened the door to substantial savings for the user who is willing to select only the equipment and services he needs at the price that makes the most sense," said Berlent.

"Those users who are either

unable or unwilling to cut the umbilical cord with IBM will be paying more for EDP in 1970," Berlent added. "Now that the IBM umbrella has been removed, it is incumbent on all EDP executives to find out for themselves if there is a less expensive way."

"They should investigate the cost of systems and programming support as well as EDP education from all sources before arriving at any decisions."

Since hardware is 50% of total cost, savings can be realized both through purchase of a used

system rather than a new one and through judicious purchase of other services. "This can result in a total savings of up to 30%," he said.

## CW's Racing Car Finishes First In Its Class at Bridgehampton Track

BRIDGEHAMPTON, N.Y. — Computerworld's New England regional sales manager, Robert Ziegel, finished first in

his class in the Area 1 Championship Race July 20, in CW's Crossle 16 F Formula Ford.

There were about 25 cars in the mixed race, half in the Formula Ford class.

Ziegel was challenged in the early stages of the race by Frank DelVecchio Jr., in a Lotus 61. "He was trying to catch me and went off the course through a grassy area," Ziegel said. The car's radiator air inlet filled with grass.

When DelVecchio got back on the track, he had to run more slowly to prevent the car from overheating.

There was only one close call during the race. Ziegel was chasing a car which was leading in the Formula C class when the car broke an oil line and spun in front of him. "I almost hit him and nearly spun in the oil myself," Ziegel said.

The August schedule for the CW car is Aug. 2, Limerock Continental Championship, Lime Rock, Conn.; Aug. 9, Watkins Glen National; Aug. 23, Area 1 Championship, Lime Rock; and Aug. 31, Bryar Motorsport Park National, Laconia, N.H.

## DATA COMMUNICATION IDEAS?

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## Terminal Can Also Serve As Stand-Alone System

PHOENIX — A new small-scale computer designed primarily to serve as a remote terminal for a large system, but also possessing capabilities of a free-standing machine, has been announced by General Electric.

The new remote terminal system — the GE-105 RTS — can be used to communicate with all computers in the GE-100, GE-400, and GE-600 lines as well as with computers of other manufacturers, GE said.

The new system allows low-cost local data processing while providing remote use of a large central computer when needed.

Data to be transmitted to a central computer can first be reduced, validated, and edited by the GE-105 RTS. It also can be returned from the larger computer in raw and unedited form and edited by the GE-105 RTS. In each case costly charges for computer time and communication lines can be reduced, GE said.

A basic system is comprised of a 4,096-byte memory, a 300-card/min reader, a 250-line/min printer with 120 print positions, and a half-duplex synchronous single-line communication controller.

Data transmission rate is 2,000 bits/sec over public telephone lines and 2,400 bits/sec over leased common carrier voice-grade lines.

Options include an additional 4,096-byte memory (for 8,192

total), 16 additional print positions (for 136 total), and a card punch.

Monthly rental ranges between \$1,145 for a basic GE-105 RTS system to \$1,675 for a system with all options. Selling prices are \$56,670 upward to \$78,940, depending upon configuration. Initial deliveries are scheduled to begin in December with a delivery time of six months after contract approval.

The GE-105 RTS uses a full set of software for on-site processing and is fully compatible with all other GE-100 computer systems, GE said.

Remote terminal functions of the GE-105 RTS are provided by data communications software packages which include subroutines for message transmission and reception, simultaneous card reading and transmission, and simultaneous reception, printing and/or card punching, GE said.

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## Time-Sharing Services Get Some Blame As Phone Services Fall Behind Demand

WALTHAM, Mass. — Are computers being made the goat for poor telephone service? Perhaps. New England Telephone re-

sponded to charges of poor service here by issuing a booklet, "The Waltham Service Story," which explained that although

service had not been adequate, extra effort was being made to improve it. Explaining the occurrence of the problem, one page of the booklet is nearly all devoted to the growth of computer time-sharing. It also mentioned that the number of telephone calls placed in Waltham had increased by 56% in the past five years, but this fact was not stressed.

A Bell Telephone spokesman, Richard Flynn, conceded to CW: "It is unfair to place the blame on computer time-sharing; that is only part of the problem."

But readers of the booklet would probably assume the computers were largely the cause of the problem. The Booklet stated:

"A major factor contributing to the extraordinary heavy use of the telephone network in Waltham is business customers using sophisticated data equipment."

"About 25% of the data-ports in the state — telephones connected to a computer — are located in Waltham. A data circuit uses up to 10 times the holding time of an average telephone user."

"The impact on telephone equipment is especially acute in Waltham which has seen more than a half-dozen computer time-sharing companies — which require lengthy data holding times — located in Waltham during the past 1-1½ years."

But Flynn told CW that, "It was certainly not our intent to say that computers are the primary problem," and that such a view would be "an unfortunate interpretation." He stressed that time-sharing is only one of many problems, including general growth far in excess of expectation. He also noted that the situation was complicated by a lengthy strike in 1968. Flynn also noted that similar problems are occurring in downtown Boston and Cambridge.

The Massachusetts Department of Public Utilities recently lashed out at New England Telephone, charging that service was inadequate, that projections of future use were never followed up to see if they were correct, and that the company has been using the strike as an excuse for too long. At the same time, the DPU issued orders demanding immediate improvement.

## Univac Will Not Unbundle, Plans No Policy Changes

PHILADELPHIA — Univac has decided not to separate the pricing of its products and services, thus following in the footsteps of Honeywell.

Since IBM announced unbundling June 23, Burroughs has announced it will offer unbundling on an optional basis, and Honeywell has announced it will not unbundle.

Univac said that IBM's action "will not affect or change the pricing policy governing the

rental or sale of Univac products, systems, or services."

The Sperry Rand division added that "the developments of the past few weeks do not justify any modification of our established practice of 'packaged pricing.'"

Univac also noted that those products and related services which have previously been priced separately will continue to be offered on the same basis as in the past.

## Youth Building Computer With 8,192-Word Memory

(Continued from page 1)

manufactured computers, he said.

When completed, its memory capacity will be 8,192 12-bit words and it will have both macro- and micro-programming capabilities.

The design for his new computer was adjudged "outstanding" (superior even to a first-prize rating) in the Chicago Area Catholic Student Science Exposition held April 26 at the International Amphitheater and is entered in the State Science Fair at Urbana.

He is also at work on plans to program the new machine in Fortran (he is preparing a compiler), assembly language, and machine language.

### Use in Research

"Mainly, I'll use the computer for research in designing my next computer. This is where its capability for micro-programming will come in handy. You see, functional components are the same in all computers; the only differences are in their organization and in the interconnection between these units. Through micro-programming, I will be able to interconnect this computer in many different

ways and thereby simulate other computers."

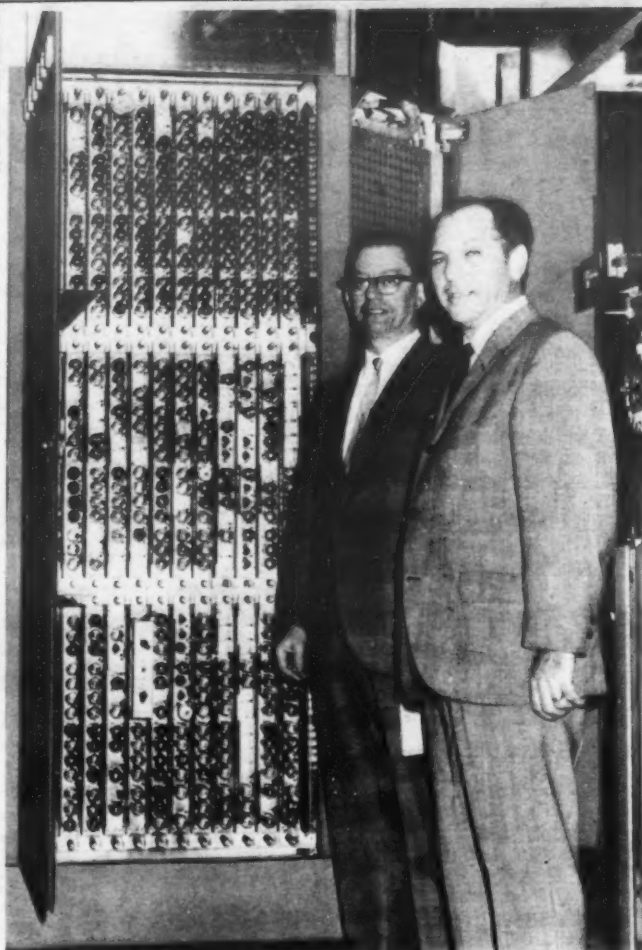
Does he see any end in sight to his desire to continue to build computers?

"No," he said. "And meantime, I'll have my own private computer that will be of great help to me in homework in my college courses. It will be able to do any numerical operation and should be very helpful in homework for integral calculus or differential calculus, matrix multiplication and addition, matrix rotation, list processing — anything at all having to do with mathematics."

Dodson's personal interest in computers dates back to a hobby in model railroading that started when he was 13. That led him into electronic automatic control systems for signaling and controlling train operations.

"When I began making circuitry that would control and operate the train automatically, that got me interested in anything electronic and automatic, and that led me straight to computers," he said.

His older brother, William, now 26 and a systems analyst for Univac, also contributed to Robert's interest in electronics.



## Sentimental Visit

The Univac II at Univac World Headquarters, Blue Bell, Pa., gets a last sentimental visit from Herman Lukoff, director of research and advanced technology, and Nat Brisgone, data processing operations manager. Lukoff helped design the second generation computer which used 5,000 vacuum tubes and required 1,200 sq ft of floor space. Recently retired, the machine has since been dismantled.

## New Controller Operates Like Just Another Tape

(Continued from page 1)

answering, mixed-mode line speeds, and multiple-device support. The major difference seems to fall in the area of software support.

The 270, through the use of a DDP-416-compatible programmed control unit, with 8K memory, appears, to the user, exactly as if it were an IBM 2400 tape drive. The commands are identical, the IBM software support is complete for all systems and operating environments, and the unit can therefore be run under any of the languages available with the S/360.

This is accomplished through the use of the rewind and wait for completion capability of the S/360. Issuing an OPEN command makes the devices accessible. When one desires to issue a message, one simply issues a rewind and wait command. The combination of the software in the 270 and the S/360 hardware does the rest. For incoming messages, polling is eliminated through the use of the hardware interrupt capabilities. When a message is received, a COMPLETION flag is posted, which signals the program that a message has arrived.

Additionally, the company claims, the 270 requires little or no time on the part of the central processor. Messages are automatically loaded into core

through the use of the tape I/O commands, permitting the use of various message lengths in any desired mix. The actual length of the message is supplied through the hardware read logic.

Because the 270 is actually a computer, there are no additional requirements for translation from one bit-code to another. These activities can all be performed in the 270, significantly reducing the load on the CPU. Specialized routines to perform most types of conversion are provided, and additional routines will be made available on delivery, the company claims.

Because the 270 is programmed, according to the company, the core normally required for the use of either the Basic Telecommunication Access Method (BTam) or the Queued Telecommunication Access Method (Qtam) is eliminated. This can reduce the working storage requirement for a program by 10K to 30K bytes, the company claims.

Additionally, the unit can operate on either one or two selector channels, therefore lightening the load on the multiplexer channel (normally required with the 2701).

Deliveries for the 270 are scheduled to start during the first quarter of next year, and orders are being accepted immediately.

## Group to Probe Into Data Banks

OTTAWA — The Information Processing Society of Canada, concerned with the potential effect of data banks on individual privacy, has voted to establish a committee to study the implications of such banks.

The action by the 1,500-member society was taken at the suggestion of C.C. Gottlieb, director of the University of Toronto's computer center.

"There are almost no legal safeguards to prevent files on us from being used without our knowledge, and in ways which could be damaging," Gottlieb said.



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## Library Tape Costs \$100

## U.S. Offers 6 Utility Programs

WASHINGTON, D.C. — Among recent publications of the Office of Standard Reference Data have been two devoted to descriptions of a number of general-purpose computer programs for file manipulation, text editing, and data retrieval. Announcements of these reports have stimulated sufficient demand to warrant the release of a magnetic tape through the Clearinghouse for Federal Scientific and Technical Information, according to the National Bureau of Standards.

The price of this tape is \$100, and it is identified by CFSTI Number PB-183142. The price represents a small fraction of what it would cost to keypunch the programs (in excess of 2,500 cards) from the published reports, an NBS spokesman said. The tape contains blocked card images of the program decks.

The programs, developed by the staff of the Data Systems Design Group of the Office of Standard Reference Data, are written in as neutral a dialect of Fortran as possible, so that they can be run with little or no modification on any computer having a Fortran compiler, he said.

The tape consists of two files of records of 720 characters each. Each record consists of nine 80-column card images.

## Nuclear Fuel Management Systems Set

ST. LOUIS, Mo. — An agreement for a cooperative effort to develop and market nuclear fuel-management computer programs for the electric utility industry has been announced by Atomic Power Development Associates (APDA) of Detroit and McDonnell Automation.

These fuel-management computer programs will enable nuclear-powered electric utilities to achieve optimum fuel-cycle costs, according to Robert L. Harmon, vice-president and general manager of McDonnell Automation. Nuclear fuel management includes the various stages of plant design, fuel procurement, licensing, core utilization, and reprocessing.

"The dollar expenditure for nuclear fuel supply over the life of a plant more than equals the initial plant investment," said Alton P. Donnell, vice-president and chief executive officer of APDA. "This explains the strong motivation for utility companies that own nuclear plants to become proficient watchdogs in this phase of the operation."

McDonnell Automation will process the programs on its large-scale computers via data transmission terminals installed in electric utility plants.

APDA, a membership company made up principally of utilities, has been active in nuclear research and development for the past 15 years.

The first field of 37 records contains the Reform program as listed and described in *Reform: A General-Purpose Program for Manipulating Formatted Data Files* (40 cents), in NBS Tech. Note 444, by R.C. McClenon and J. Hilsenrath. The Reform program makes it possible to manipulate files containing as many as nine different card formats. It can select or abridge information from any of the cards and print that information or reformat cards in any desired order of arrangement. Provision is made for introducing as many as 26 arbitrary strings of characters, each of which may be up to 79 characters in length, thereby permitting the insertion of labels, headings, or comments into the file.

The second file of 248 records contains a number of programs as listed and described in *Edpac: Utility Programs for Computer-Assisted Editing, Copy Production, and Data Retrieval* (70 cents), NBS Tech. Note 470, by

C.G. Messina and J. Hilsenrath. Edpac is comprised of five utility programs: Scramble, Substitute, Search, Blocksearch, and Justify.

Scramble scans an input file for specified characters that it replaces by different characters.

Substitute similarly replaces strings of characters with other strings.

Search and Blocksearch scan for the occurrence of certain strings and list the lines of blocks, respectively, in which they occur.

Justify produces right-hand justified text for printing on a card-controlled typewriter or on an extended-character line printer.

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# 16-Bit Computer Users Can Have 2311 Compatibility

PHILADELPHIA — A plug-in hardware package that has the potential of interfacing almost any 16-bit computer with IBM 2311 and similar disk drives has been scheduled for first production shipments in September.

The 1010 disk controller is designed to minimize the need for extensive software, with everything except the driver handled by hardware.

The unit was designed originally around Hewlett-Packard 2116B and 2115A computers.

The company, Community Computer Corp., says that additional models are being manufactured to interface most other 16-bit processors with other compatible disk drives, and plans are being completed to extend the capability to include the 2314.

The 1010, as currently manufactured, allows one or two processors to interface up to eight 2311s.

The interface permits transfer on one drive simultaneously with search on any or all of the others, according to the company. Large data blocks of up to 18,660 words can be transferred. The interface costs \$21,500.

Community Computer Corp., 185 W. School House Lane, Philadelphia, Pa. 19144.

## Payroll Entry System

A payroll and labor cost-accounting system that produces magnetic tapes compatible with IBM 360 (800 bits/in.) and other manufacturers' drives is in production, for delivery in four months after receipt of order.

The Epic system consists of a central control unit with one or more tape drives, and clock stations, the number depending on the number of employees to use

## NEW PRODUCTS

the system at peak hours.

The employee puts a badge in the clock station reader and gets it back, without noticeable delay, with the time in (or out) displayed to him in hours and tenths.

Time and badge number are entered on the tape after verification by read/write electronics.

The console unit is said to be capable of receiving, sorting, and verifying up to 4,500 employee transactions per minute, from up to 50 separate remote clock stations.

The console and control unit is priced to lease for \$421 per month or can be purchased for \$18,750. It includes one tape drive, but more are optionally available. Each clock station will lease for \$52.50 per month or may be purchased for \$2,500.

The company, located at 1615 Stemmons Freeway, Dallas, Texas, will support the system with software.

## Digital Data Logger

A portable, digital tape recorder designed for low-cost, in-field data logging of industrial and scientific parameters has a capacity of up to one-half million characters.

The Type 603 digital data logger weighs only 6 lb. Packaged for all-weather use, the unit is rechargeable, battery-powered, and cartridge-loaded, the developer says.

The logger will record a binary coded decimal word of up to 24

digits on 4-channel, 4-track, 1/4-in. magnetic tape at a packing density of 100 BCD digits/in.

The 24 BCD digits, accepted in parallel form, are recorded sequentially at the rate of 10 digits/sec. At the end of each record word an audio tone is sounded.

The recorded data is in a computer-compatible format for direct digit-by-digit translation to digital computer input, 1/2-in., 556 BPI magnetic tape storage, or punched paper-tape storage. Visual display is available as an optional feature.

Applications include recording of environmental data for the oceanographic, petrochemical, forestry, and agricultural industries as well as data acquisition for utilities, public transportation networks, and general business applications.

The standard model of the new logger is preprogrammed to a 24-digit format. Variations of the format and word length are available to suit special needs.

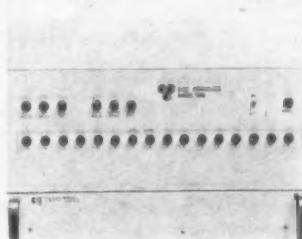
For additional information write to Braincon Corp., Marion, Mass. 02738.

## Graphics Terminal

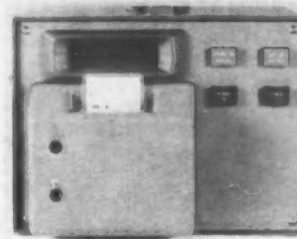
A lower-cost (\$40,000-\$50,000) interactive graphics terminal contains a 4K processor for image processing, display handling, and communications formatting. The operator's console of the AGT/5 contains a CRT with light pen and controls.

The manufacturer, Adage, Inc., has designed the unit as a dependent extension to medium-scale computers, such as the PDP-10; Sigma 5 and 7; 360/40, 44, and 50; the CDC 3300; and smaller machines.

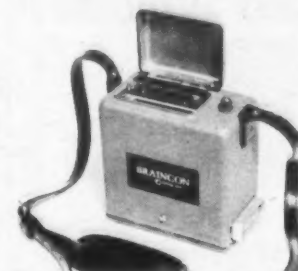
The company supplies software including a display file proces-



Disk Interface



Payroll Entry System



Digital Data Logger



High-Speed Terminal

sor, debugging, text editor, and an assembler. Communications and formatting routines specific to the host machine are also available.

Applications include automated, printed circuit-board layout, communications, seismic and physiological signal analysis, computer-aided design, and text editing, according to the company.

Optional features include expansion of core to 32K of 30-bit words, paper tape I/O, and hardware character generation.

Adage, Inc. is at 1079 Commonwealth Ave., Boston, Mass. 02215.

## High-Speed Terminal

A high-speed remote terminal compatible with ASCII and EBCDIC is a full duplex system

said to allow simultaneous input, transmit, receive, and output.

The CP-4 can be interfaced to any standard modem through Bell Dataphone 201 or the equivalent.

It can support a bit rate of 4800 bits/sec over a private line or 2000 bits/sec on a switched line.

Three models are offered: Model I, for \$42,500, has a 315-line/min printer with 132 columns and a 300-card/min reader; Model II, costing \$29,000, has the same rear reader and a 120-char/sec Ink-tronic printer; and Model III has a 300-line/min, 80-column printer and costs \$34,100. Deliveries are stated at 120 days after receipt of order.

Data Computer Systems, 1612 S. Lyon St., Santa Ana, Calif. 92705.



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## Editorials

### Man on the Moon

If I had to single out the piece of equipment that, more than any other, has allowed us to go from earth-orbit Mercury flights to Apollo lunar trips in just over seven years, it would be the high-speed computer.

— Christopher C. Kraft Jr.  
Director, Flight Operations  
Nasa Manned Spacecraft Center

The role of the computer in manned space flight has quite properly been overshadowed by the daring of the astronauts who bet their lives on these electronic marvels.

But it is also time to reflect on the fact that these incredible journeys would be impossible without electronic computers. In less than 25 years, computers have become man's scout, guide, protector, helpmate, and backup memory.

In honoring the men who go to the moon and the depths of the sea, we should also honor those men whose vision and research led to the development of man's best friend, the electronic computer.

### Leave It to Experts

One of the software houses points out that you wouldn't try to build your own computer, so why try to design your own software.

The point is worth a lot of thought.

In the early days of electronic computing, if you wanted software, you had to write it yourself.

That's simply no longer true.

One of the reasons that there is a critical shortage of DP personnel is that too many people are trying to build their own systems. The chances of duplication of effort are obvious.

How long has it been since you compared the cost of maintaining a programming staff against the cost of buying all your software outside?

### Viewpoint Disputed

On the facing page, Dr. Bauer says, "We must get to the point where we no longer consider it dishonorable for a man to be a nonproductive component of society."

We disagree!

The goal of computer technology is to eliminate work unfit for a human being to spend his time on.

This may mean that humans won't have to "work for a living." It does not mean that they will have to become nonproductive.

The most productive people in the world are often the people who don't have to "work for a living." These include the rich and the wives of the so-called "well-to-do." These people devote time to important projects that would never be undertaken if they had to wait for financing by government or private industry.

Another group of the "super-productive" is the people who forego financial gain to devote their time to various forms of inadequately funded humanitarian projects.

For that matter, when is any man more productive? When he performs a machine-level task for pay or when he comes home and "works" on his hobby, whether it be the Boy Scouts or the most beautiful garden in the neighborhood?

We agree that the time is coming when more and more people may have to be financially supported by society.

But we urgently disagree that these people should become "nonproductive." We have had too much of that thinking in our welfare programs already.

We must provide the educational opportunities to convince these people that rather than being nonproductive, they can be super productive and lead very fulfilling lives.

## Letters to the Editor

### Service Bureau Customers Not Hurt by Unbundling

Further to the letter from Mr. George S. McLaughlin Jr. in your July 16 issue, while I agree with the sentiments expressed, it sounds very much like the writer finds himself with no alternative.

For some years now, we in the data processing results business have known that any small- to medium-size user did have viable and economical alternatives to machine installation, namely, the contracting for results only, from a qualified service center.

My clients are still receiving the data processing results they contracted for. They face no significant cost increase. They have always enjoyed the ability to "know, budget, and plan within their data processing efforts."

The cost to our average client is going down, not up. If Mr. McLaughlin will exercise his private initiative by contacting any qualified service center, he can join the "select few" and not be subject to the "customer-be-damned" attitude of anyone.

Leonard J. Palmer  
President

CompuTerminal Corp.  
San Francisco

### Whenever IBM Is Sued, Customer Is Hurt Most

The lead article ("... IBM Unbundling") in your issue of July 9, 1969, is not the sort of objective reporting your readers have become accustomed to and now expect. This is the best whitewash job I have ever seen, and those of us who are IBM customers fully realize that this indeed is the most inflationary move made by any company in recent years.

One cannot but appreciate the merits of separating prices of hardware, software, and service. Most customers feel, as we do, that this is preferable and may stimulate competition, but which of IBM's customers truly believe that a mere 3% reduction in hardware prices is justified?

It is difficult to believe that the heat of inflation alone has melted the so called "IBM iceberg" to the size of an ice cube.

As usual, whenever IBM is sued, the customer is the party hurt the most. I noticed that the IBM stockholders were delighted. Perhaps it's an indication that now they are going to get something for nothing and not vice versa.

Eugene L. Kurowski  
Executive Director

Central Business Administration  
Chicago

The story you refer to was clearly labeled a "news analysis," indicating that it involved interpretation. Ed.

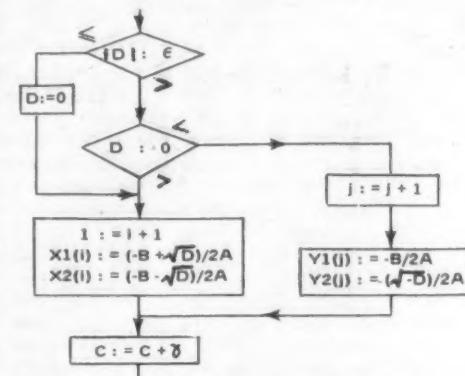
### Flowchart Error Spotted In BCS Exam Reprint

In your article, "British Computer Society Develops Qualification Exam," (June 25, 1969), there is an error. It is stated that the flow diagram

on page 20 describes a method of solution for the quadratic equation,

$$ax^2 + bx + c = 0.$$

A correction to the flow diagram, omitting the obvious misprint A :  $ax$  is as follows:



Raymond L. Tarp

Pleasanton, Calif.

### Patent Holder Offers Data on Blood Test

I read your recent article entitled "Computerized Blood Test Developed by Engineers" with extreme interest. As a former electrical engineer, I can appreciate the enormity of the problems encountered and transcended by Prof. Eden and doctoral candidate Young, and would like to congratulate them jointly on the success of their system. Your article states, however, that the development of a computerized technique for administering the "differential" white blood count test is new. This is not correct.

I have enclosed a copy of a patent of mine filed with the U.S. Patent Office Dec. 31, 1963, and issued April 18, 1967, entitled "Blood Cell Recognizer" and which performs this differential analysis. Similar to my approach, the MIT developers use the cell recognition criteria of color, shape, and texture; however, I use the one additional criteria of cell size to assist in the differentiation process.

I would appreciate it if you would forward the enclosed copy of my patent to Eden and Young. Perhaps they can make use of the hardware techniques I illustrate and, coupled with the color electro-optical scanner developed at MIT, implement a more sophisticated system, with the public being the prime beneficiary of the best of both systems.

E.T. Smithline  
Systems Department

Chas. Pfizer & Co.  
New York

Done. Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 60 Austin St., Newton, Mass. 02160.



"And a Good Morning to You!"



"Must You Read at the Table?"

Viewpoint: Dr. Walter F. Bauer

## Traditional Attitudes Toward Work Must Change in a Computer Society

The computer, in time, will create an elite class, a leisure class, and a greatly expanded unemployed class supported by the state, according to Dr. Walter F. Bauer, president of Informatics Inc.

"Computer technology will create an increased standard of living," he said, "and most likely a society where relatively few can produce enough for all."

He cited engineers, particularly those computer-oriented, as being among the potential "elite group of humans" that will become "the creative and productive force in our society."

"The five-day work week will become a four-day work week, followed by a three-day work week," he prophesied, "producing a leisure class and a greatly expanded class of government-supported unemployed."

"We shall have to understand," he added, "that the traditional attitudes toward work in our society must gradually change. We must get to the point where we no longer consider it dishonorable for a man to become a nonproductive component of society."

Stressing the sociological and cultural influence of the computer, Bauer compared its impact to that of the development of the printing press.

"Creation of the printing press did not replace authors and writers," he said, "rather it permitted economical and efficient distribution of information to the masses. It was not a replacement, but a new instrument, for intellectual activity, just as the computer is today."

"It appears," he added, "that computer technology will virtually eliminate the printed work as we know it today. The time is coming, and soon, when computer-produced microfiche will revolutionize education. Students will be able to store hundreds of text books in a small slot in their desks, and vast information thus available for reproduction from computer memory will never go out of print."

"Following shortly after this, nearly all literature will be recorded on magnetic tape. There will be no such thing as a book going out of print, since it will always be available in archival records using magnetic tape. Although it may appear distasteful to us today, a few generations from now people will curl up on their couch with their 'electronic reading instrument' and will be able to select anything from the great classics to today's sports page."

Bauer noted that some sociologists "have mused that computers will adversely affect the intellect of future generations because young people will do less thinking."

"On the contrary," he declared, "the computer poses an intellectual challenge. The computer does not think. Man thinks and the computer processes. Just as television has had a catalyzing effect in making people more curious and aware, the computer will stimulate men to reach high-

er levels of understanding and curiosity — and at the same time supply a comprehensive source to satisfy both."

In the near future, according to Bauer, the computer will have a more prosaic effect upon society.

"Our freeways and streets will carry more traffic," he said, "by reducing travel time during peak hours. The need for money in physical form will be eliminated. Our entire monetary system is basically an information system. When computer technology enables us conveniently and immediately to deduct the price of a pound of ground beef from our credit at the bank, there will

be no need to carry physical evidence of that credit in our pocket in the form of money."

He considers the greatest challenge of all in the computer age to be the creation of a mechanical being in man's intellectual image. "This is a laudable challenge," he declared, "because in the process of creating a mechanical 'human,' man will discover what makes him act inhumanly toward other men. Having accomplished this, we stand a good chance of achieving Shangri-La where all people live in peace with brotherly understanding."

(From an address at West Coast University, Los Angeles.)

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Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1316 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 120 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

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To arrange for a demonstration, contact Gary Tischler, Director of Marketing (201) 334-3713

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## Japanese Study Team Visits

Study team of Japanese business leaders in the data processing field was briefed on Management Information Services program at Samsonite Corp., Denver. Shown are C.W. Kribs and T.P. O'Mara of Samsonite, with Tokiro Tanabe and Isamu Watanabe. Effort was co-ordinated by DPMA and the Nippon Office Management Assoc., Japan.

## DP Operations Topic of Panel Talk

NEW YORK — "Computerized Data Processing Systems Operations" will be the topic of a panel discussion at the Packaging Institute's 1969 Annual National Packaging Forum to be held Oct. 6-8 at the Hotel Americana.

Among the speakers will be Dr. John R. Huffman, project manager, industrial systems division, Aerojet-General Corp., Frederick, Md., who will discuss com-

puter control of automated handling systems.

This will be one of several concurrent sessions to take place at 2:15 p.m. on Wednesday, Oct. 8.

Over 300 specific packaging questions will be answered by 80 speakers at 20 sessions to be held over a three-day period. For full program details and registra-

tion forms, contact The Packaging Institute, 342 Madison Ave., New York, N.Y. 10017.

## Software Show Is One of Three

NEW YORK — The first of three regional computer software and peripherals shows, Compso East, will be held Jan. 19-21 at the New York Hilton Hotel.

Exhibitors will include peripherals manufacturers, time-sharing centers, software companies, computer leasing firms, supply manufacturers, communications specialists, and consulting services.

In addition to the expositions, Compso will feature a series of seminar programs on computer peripherals and software applications, with management rather than technical orientation.

Compso is planned for the businessman and the data processing manager and hopes to draw 25,000 attendees from the ranks of top and middle management.



COMPUTERWORLD

## Societies

## Systems Analyst Is Link In Planning Activities

MANCHESTER, N.H. — "The systems analyst holds the key to the success of a corporation's long-range planning efforts, said Charles A. Morrissey, executive vice-president of Computer Environments Corp.

Morrissey, in a speech to the New England chapters of the Association for Systems Management, said that the systems analyst is the linking individual who insures that the components of the plan are properly assembled, formulated, and submitted for proper action.

To manage the activity of a company's long-range plan, he said the systems analyst should have a thorough understanding of the planning sequence and should either prepare, or participate in the preparation of, the documentation to be used by managers in submitting data.

Morrissey said that the systems analyst should become an integral part of modern corporate management. "Top management's ability to analyze, decide on, and implement company objectives is primarily a function of an accurate and timely information-handling system, which is ultimately the proper domain and responsibility of the systems analyst," he concluded.

## IVC Congress To Meet in Fall

CHICAGO — The International Visual Communications Congress will be held here at the Amphitheatre, Oct. 13-16.

Technical Sessions chairman is Kendrick R. Baxter, The Seeburg Corp., Chicago.

For more information, write to International Visual Communications Congress, 305 S. Andrews Ave., Suite 610, Fort Lauderdale, Fla. 33301.

## Annual Meeting of SMIS in Chicago

MINNEAPOLIS — The Society for Management Information Systems will hold its first annual meeting here on Sept. 8 and 9.

The theme will be "bridging the gap between the management function and information system technology."

Contact G.W. Dickson, Management Information System Research Center, School of Business Administration, University of Minnesota, Minneapolis, Minn. 55455.

## Dr. Emanuel Piore Will Address ACM

SAN FRANCISCO — Dr. Emanuel R. Piore, vice-president, chief scientist, and member of the board of IBM will address a luncheon meeting of the ACM at the group's annual conference and exposition Aug. 27, at the San Francisco Civic Center.

The conference and exposition will be held Aug. 26-28.

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## Educational Guidance Counsellors Are Exposed to EDP, Computer Information

ENGLEWOOD CLIFFS, N.J. — An approach to the task of providing secondary and college guidance departments with usable information in the areas of EDP and computer programming has been initiated by Computer Dynamics Institute.

The institute, the educational division of Advanced Manage-

ment Institute, is a consulting firm specializing in computer applications.

A special guidance seminar was devised in which representatives from school guidance departments and staff members of the institute participated. It is conducted in the main conference room on the premises of the institute at 120 Sylvan Ave., Englewood Cliffs.

The concept was introduced by Fred G. Collins, marketing director, who found, after visiting several guidance offices, two major flaws regarding EDP.

First, the data processing knowledge of most counsellors was limited; second, guidance counsellors shied away

from recommending computer programming to students because of the "vocational school stigma" that has developed because of the unethical and unprofessional actions of a few institutions.

Objectives for the seminar were developed and include an explanation of EDP in general and of computer programming in particular; a demonstration of equipment; an explanation of the scope and content of programs offered by the institute; an assessment of employment in the field and projections of future career opportunities; and a rigorous review of the institute's staff and inspection of facilities and equipment.



COMPUTERWORLD

# education

## Vt. Data Processing School Receives VA Accreditation

BURLINGTON, Vt. — The first data processing school in Vermont to receive accreditation by the Veteran's Administration is Computer Environments Institute (CEI) of Burlington.

Accreditation was awarded as a result of the two-year-old school's fulfillment of federal and state requirements that identify CEI as a quality educational institution for veterans.

With its accreditation, the school now is able to offer courses in computer education to military veterans, who are subsequently reimbursed for tuition costs by the federal government.

CEI occupies a new building at 115 College St., Burlington, and offers day, evening, and Saturday classes in computer programming and operation.

### book reviews

*The Sciences of the Artificial* — Herbert A. Simon  
Publisher — MIT Press, Cambridge, Mass.

This book reveals the design of an intellectual structure aimed at accommodating those empirical phenomena that are "artificial" rather than "natural." The goal is to show how empirical sciences of artificial systems are possible, even in the face of the contingent and teleological character of the phenomena and their attributes of choice and purpose. Developing in some detail two specific examples, human psychology and engineering design, Professor Simon describes these sciences as they emerge from developments of the past 25 years.

"Artificial" is used here in a very specific sense — to denote systems that have a given form and behavior only because they adapt (or are adapted), in reference to goals or purposes, to their environment. Thus, both man-made artifacts and man himself, in terms of behavior, are artificial. Simon characterizes an artificial system as an interface between two environments — inner and outer. These environments lie in the province of "natural science," but the interface linking them is the realm of "artificial science." When an artificial system adapts successfully, its behavior shows mostly the shape of the outer environment and reveals little of the structure or mechanisms of the inner. The inner environment becomes significant for behavior only when a system reaches the limits of its rationality and adaptability, and contingency degenerates into necessity.

*Computers & The Law — An Introductory Handbook* — Robert P. Bigelow  
Publisher — Commerce Clearing House, Inc., Chicago, Ill.

A 226-page paperback produced by the Standing Committee on Law and Technology of the American Bar Association, the work is designed to be an introduction to the state of the art and the use of computers by lawyers. It includes an introduction, a series of seven articles introducing machine methods, a series of eight articles on the computer in the practice of law, nine dealing with government and the computer, and 12 dealing with the lawyer and his client's computer. Three articles handle jurisprudence. A glossary and bibliography are provided.

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Communications and Data Products Division

# Dimmick Is Named DP Manager at Bethlehem Steel

BETHLEHEM, Pa. — Leonard R. Dimmick has been appointed manager of corporate data processing for Bethlehem Steel Corp.

Dimmick, advancing from assistant manager of corporate data processing, is succeeding James H. Woodhouse, who has retired.

A native of Bethlehem, Pa., Dimmick joined Bethlehem Steel in March, 1943. He took a leave of absence for service in the U.S. Army Air Corps in 1944-1945. He then enrolled at Lehigh University, graduating in 1949 with a B.S. in business administration. He earned an M.B.A. at Lehigh in 1955.

Dimmick returned to Bethlehem Steel in 1949 as a tabulating machine operator in the accounts-receivable division of

the accounting department at the home office.

He was promoted to assistant section head in 1954 and three years later was transferred to works accounting at the Bethlehem plant.

He was named chief of data processing there in 1962 and served in that capacity five years before returning to home office accounting. He became assistant manager of corporate data processing in 1968.

Dimmick has announced the appointment of Ronald L. Zimmermann as assistant general manager of corporate data processing.

Zimmermann, a native of Teaneck, N.J., was graduated from Whittier College with a B.A. in political science.

## Users on the Move

After a brief assignment in production scheduling at the Los Angeles plant, he was transferred to Bethlehem's San Francisco offices as a systems supervisor in 1959.

He held that position until his promotion to assistant to manager of the order division at the home office in 1965. He advanced to assistant manager, order division, in 1967.

**Champion Named Santa Fe Information Systems V.P.**  
CHICAGO — Raymond M.

Champion Jr. has been appointed vice-president—information systems for the Santa Fe Railway.

The appointment is effective August 1. Champion succeeds Flory Mauriocrat, who has retired.

With time out for two 21-month stints with the U.S. Army in 1945-46 and 1950-52, Champion alternated between college and railroading during summers with Santa Fe, receiving his B.S. in civil engineering from Texas A & M in 1949 and his LL.B. from the University of Michigan in 1954, after which he devoted full time to the Santa Fe.

Champion served in numerous positions in the engineering and operating departments and was named assistant director of cost analysis and research at Chicago

in September, 1959. He returned to the operating department as trainmaster in 1961 and was stationed at Needles, Calif., when he was appointed assistant to the president—staff studies at Chicago in October, 1964.

## Kidney Named Manager Of Systems Analysis

TOLEDO, Ohio — Adrian W. Kidney has been appointed manager of systems analysis for Libbey-Owens-Ford Co.

Kidney, who has been supervisor of office systems, methods, and procedures since 1958 will have the responsibility for the planning, analysis, design, and post-implementation evaluation of corporate systems.

A Toledo native, Kidney joined L-O-F immediately following World War II, serving as cost analyst from 1946 to 1948. He was a senior internal auditor from 1949 to 1954 and supervisor of office methods and procedures from 1955 to 1957.

Before serving in the U.S. Navy during World War II as a lieutenant, he was employed by Arthur Andersen and Konopak and Dalton, public accountants. He is a graduate of Ohio State University.

## Two Promoted in Carling's Data Processing Department

CLEVELAND — Carling Brewing Co. has announced two promotions in its corporate data processing—office administration department.

John T. Bitter advances from the post of procedures project manager to assistant director of data processing—office administration.

Harold L. Hudson, who has been a programmer, succeeds Bitter as procedures project manager.

Bitter joined Carling in 1958 and has advanced through a series of positions. A native of Sandusky, Ohio, he attended the Cleveland College of Western Reserve University.

## Tator Becomes Manager Of Systems and Procedures

FULLERTON, Calif. — P.E. Tator Jr. has been appointed corporate manager of systems and procedures for Beckman Instruments, Inc.

In the new assignment, Tator will be responsible for the design of business procedures and systems at Beckman operations throughout the world.

A member of the Beckman organization since 1959, he was formerly a senior systems analyst.

## Systems and Programming Managers Appointed

LOS ANGELES — J. Ward Hemenway has been appointed systems manager for Carte Blanche Corp. and Robert A. Sorensen, programming manager.

Hemenway joined Carte Blanche as a senior systems analyst in December, 1968, after eight years in systems and programming at Bullock's department stores.

Sorensen, also a senior systems analyst, came to Carte Blanche in March from Arden Maffair Corp.

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July 30, 1969

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## New Package Can 'Help' Users Into a New Language

NEW YORK — Writing your own language, preparing job control automatically, and extending existing compilers are some of the capabilities claimed for a new \$15,000 macro-language generator for S/360. It is known as Help (highly extendable language processor), according to Advanced Computer Techniques in a recent announcement.

### Many Possibilities

Help, actually a sophisticated string processor (operating on strings of characters rather than keywords or tailored syntax) allows complete flexibility in defining the format for input and

the desired output.

The processor can be made to behave as a processor for Cobol, Fortran, PL/I, Adpac, or anything else one might desire, according to Ralph Stout, company vice-president for product development.

### Very Simple To Use

Help is very simple to learn and even easier to use, according to Stout. A series of macros is used to define punctuation and statement separation; another series of macros is used to define the actual syntax of the language being created.

Though the resulting "com-

piler" is not as efficient as a machine-language compiler developed specifically for the language used, it will perform exactly as the desired compiler would perform, allowing check-out of logic and debugging while the compiler is being developed.

### Simplifies Job Control

Job-control languages (JCL), such as the ones used for the S/360, are languages just as much as Fortran or Cobol, Stout said.

They can be defined in the same manner, allowing the user to specify simple English-like

statements and convert them into the formal JCL for a given machine.

### Extended Language Capabilities

If one desired a report-writing module for his Cobol compiler, Stout said, he could simply define the desired Cobol coding that must be produced to generate reports, and then specify the necessary macro parameters to produce tailored reports.

A Cobol source program could be passed through such a "pre-compiler," and complete Cobol coding, compatible with one's own compiler, would be produced as output.

Decision-table processing, teleprocessing, and any other type of language feature could be added with as little difficulty, Stout explained.

### Eliminates Special Precompilers

"The use of this type of package," according to Stout, "can completely eliminate the need for special preprocessors to fit specific purposes.

"It takes so little effort to use this package, and it is so flexible, that you can write your own preprocessing routines in very little time at a fraction of the cost."

### Implementation

The package is currently opera-

tional on S/360 under OS.

A DOS version will be available soon, probably in September, Stout said.

The basic version sells for \$15,000 and enhancements are available for small additional charges.

Some of the extra features available include a processing module with built-in punctuation definition for "natural" languages. (Input is expected to be in the form of English sentences, as is the case with Cobol.)

Versions of the system will be available, on request, for other hardware and operating systems, and many specialized routines will be developed in the near future, Stout told CW.

### Used To Improve Itself

One peculiar aspect of this package is its ability to produce better versions of itself. The current requirement for the OS version is about 80K characters of memory.

Through use of the package, the memory requirements are expected to be reduced to about 20K in the next few weeks.

The basic difference lies in the use of the OS PL/I compiler to produce the current version, as opposed to the use of Help to produce the new version.

## New PDP-10 Monitor Cuts 10-User Core Requirements From 100K Down to 28K

MAYNARD, Mass. — A "significant improvement" to its PDP-10, time-sharing monitor to permit multiuser access to a single program in core has been announced by Digital Equipment Corp. The improved monitor is available immediately and can be used with all PDP-10 programming languages including Fortran, Basic, Macro, Aid, Teco, and the recently announced Cobol.

Lawrence J. Portner, manager of programming at DEC, explained that with the new monitor, "only one copy of a program need now reside in core instead of requiring many individual copies for each user."

"For instance, 10 Fortran IV programs concurrently being compiled require only one copy of the 8K compiler and ten 2K user data buffer areas. This is a total of 28K as compared to a 100K requirement usually needed."

The monitor takes advantage

of the fact that a majority of the code in most programs does not change when being executed and, therefore, can be consecutively shared and re-entered by many users with no adverse effect.

The dual protect and relocation registers in the PDP-10, which provide hardware protection of programs concurrently sharing core memory, make it possible for each user to access two separate areas in memory.

The software is designed so that one of these areas will contain a copy of the re-entrant code that is shared by all users simultaneously employing that system program, while the second area contains the unique code (or data) relevant only to the individual user.

In addition to the substantial increase in the amount of usable core memory created by this monitor, this re-entrant capability also minimizes the swapping load in the system, according to

Portner.

"Since the re-entrant code by definition is never modified, it is always in its original state. Therefore, the re-entrant portion need not be saved on the swapping device when a user's program is swapping out onto auxiliary disk storage.

Using this, only the 2K user data buffer is stored on the swapping disk and the 8K re-entrant Fortran compiler need not be swapped," he explained.

## CSC Announces Cogent-II

LOS ANGELES — A new, \$25,000 version of Cogent, known as Cogent II, has been released by Computer Sciences Corp., according to a recent announcement.

### 30-Day Cancellation

The package, which rents for \$1,200 per month, runs on the S/360 and requires 65K memory under DOS and a 90K region under OS. The leasing aspect is new, according to Roger M.

Fisher, the company's general manager for the applications systems department.

The lease, which can be canceled on 30 days' notice, allows 75% of the amount paid on lease to be credited toward the sale price.

### Cobol Preprocessor

Basically, the system offers programming tools intended to speed up the process of program

development, report generation, file creation, and data retrieval.

The system can handle several sequential files or indexed sequential files. The report-generation language is "easy to learn" and allows management to generate its own reports without calling on the programming department, Fisher said.

The package is really a Cobol preprocessor that generates proper Cobol coding from simplified specification statements.

## 'Talk' Offers Wats Cost-Optimization

BRAINTREE, Mass. — Talk, a program that enables a company to provide analysis of the cost-effectiveness of its communication system, has been announced by Interactive Sciences Corp.

Talk (trade-off analysis based on linecost and knowhow) is designed to supplement manual methods for studying such communication-oriented systems as message switching, voice-grade

communication networks, large-scale telecommunications systems, and Wats networks.

The company, based at 50 Brooks Drive, stated that engineering standards, network design, load analysis, cost estimation, performance evaluation, load balancing, and cost optimization for all common-carrier services.

Analysis of 15,000 possible networks was performed in order to produce the final design.

## Several 9200 Packages Announced

PHILADELPHIA — A number of packaged software programs developed by Univac for use on Univac 9200 and 9300 systems are now available. The packages consist of fixed-assets accounting, savings account processing, mortgage account processing, general ledger accounting, CPM scheduling, and a Linco III type-setting program.

Fixed-assets accounting is a program designed to allow companies to establish effective control of fixed-assets inventory and depreciation accounting to maximize profits.

The mortgage accounting program is tailored to meet the needs of any financial institution with as few additional changes as possible to particularize the operation.

Promotion of growth and cost control are key elements in the savings account processing program, which is also designed to process depositors' records at high speed with extreme accuracy, the company claims.

The general ledger reporting system is suitable for almost any size organization, claims Univac.

### CORRECTION

Basis, a banking system (CW July 16), is being marketed by Advanced Systems Inc. for \$10,000. It was developed by the Beverly Bank of Chicago, not by Advanced Systems or by Technitrend, Inc., as reported. The system uses the Technitrend VM-1400 audio response unit.



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## 'Glad,' a Business Bookkeeping Service, Offered as Remote Time-Sharing Service

PORTLAND, Ore. — A new bookkeeping package aimed at eliminating most of the manual work involved with the maintenance of ledgers and accounting systems has been announced by EDP Central, Inc.

The package, known as Glad, is a complete service through a remote time-sharing system run by the company.

Glad is a bookkeeping computer program for creating, maintaining, and printing general ledgers and other financial reports. Designed for use in all kinds of businesses, it requires only basic bookkeeping knowledge and no programming experience, the company stated.

It has been developed and tested by the company's administrative and financial staff for the firm's time-sharing subscribers in the Pacific Northwest.

The program does everything the bookkeeper previously had to do by hand, including fiscal year-end closing and the opening of new books.

Glad (general ledger account distribution) handles such common bookkeeping chores as posting, preparing trial balances, and carrying balances forward. Because data is entered directly onto books over a typewriter-like computer terminal, most of the manual labor for these tasks is eliminated.

When fiscal reports are needed, the bookkeeper orders them from the computer.

The computer then calculates previously entered data and immediately begins sending results back to the terminal in the appropriate report form at the rate of 150 words/min.

These printouts may then be

added to the company's permanent record, but the results also are retained in storage by the computer for future use.

Glad records held in storage by the computer are kept strictly confidential. Every file is protected by a security lock known only to the person responsible.

Until it receives a unique security key from the terminal, the computer refuses access to private company records.

The service is available to time-sharing subscribers throughout Washington, Oregon, and Idaho and may be obtained in Canada through an affiliated company, React Timesharing Ltd. of Vancouver, B.C.

EDP Central's computer service offices are located in Portland, Ore.; Kirkland, Wash.; and Boise, Idaho.

## System to Ease Brokerage Paperwork Offered as a Package or as a Service

NEW YORK — Security I, a data processing system especially designed for stock brokerage firms, was announced recently by Computer Property Corp.

The system is designed to alleviate most of the paperwork problems now plaguing the securities industry and includes all conventional data processing reports associated with the back office, as well as subsidiary management reports not found in other systems, the company claims.

Security I is offered on a multi-level basis:

1. For those firms wishing to have their work processed by the company's data center opening in the Wall Street area.

2. For those firms for which on-site processing managed by the company best meets their requirements.

3. For a private service bureau composed of several brokerage firms that form their own data center on a cooperative basis. CPC will offer counseling and service in the formation and operation of a broker's private service bureau.

4. For installation in those brokerage firms having their own computers.

In announcing these new services, William J. Montgomery, company president, emphasized, "This program has been fully tested and is presently in operation by a member firm of the New York Stock Exchange."

Initially, the program will be offered to brokerage firms through the Security I center in New York. By establishing satellite data processing centers, this system will be expanded to other major cities throughout the country during 1970. Other levels of Security I will be available nationally in 1969.

## Copy Ready for Printing Via Typewriter Terminals

WASHINGTON, D.C. — Ordinary typewriter terminals can now produce directly usable printed copy for photoreproduction as well as galley proofs, according to an announcement from VIP Systems.

Available through the company's Vipcom time-sharing service, the composition is claimed to be completely compatible with the IBM ATS system and the SBC's Datatext.

It can also prepare material for direct printing through such devices as the RCA Videocomp,

the government's Linotron, and VIP's Photon composing equipment.

The service allows the user to retrieve selected portions of previously created text for reproduction or editing. The typewriter at the customer's office can be used to produce direct-proof copy, with simple control characters indicating changes in typeface, font, and size.

For customers of Vipcom, the charge for photocomposition is \$1.00 per 1,000 characters printed plus the normal costs of using the time-sharing service. Application areas expected include engineering handbooks, catalogs, manuals, educational materials, and telephone listings, according to Joan Van Horn, company president.

## Service Bureau Adds CDC 6400

DALLAS — Financial Technology, Inc., formerly Data Automation Computing Co. announced its capability to offer customers Control Data 6400 computer services.

Don McArthur, president of the firm, stated that in the past, FTI has been able to offer computing services in Dallas and New Orleans through its Honeywell 120 computer and its Univac 1107.

The Dallas-based company and its subsidiary, Delta Data Services, believe this additional capability strengthens FTI's technological ability.

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July 30, 1969

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Two Control Data 3300 systems are used for total order matching by Hornblower.

## Hornblower Uses Computer For Total Order Matching

NEW YORK — Hornblower & Weeks-Hemphill, Noyes, a major stockbrokerage, is attacking the Wall Street paper glut with a computer system that endeavors to eliminate errors from stock transactions.

The system, in operation for several months at Hornblower, performs the total order-matching function for all securities on the New York and American stock exchanges, eliminating the error-prone paper work normally associated with such transactions.

Goodbody, Inc., another stock brokerage, announced Autocage, a system to automate the back-office certificate processing, last week. [CW, July 23]

The multimillion-dollar, real-time brokerage-control system was developed jointly by Hornblower and Control Data Corp.

It is the first Wall Street system that performs the total order-matching function for all securities listed on the NYSE and AMEX, including both odd lots and round lots, at computer speeds.

At the heart of this system are two Control Data 3300 computers. One operates on-line; the other, off-line.

George Ross, Hornblower vice-president, said the second computer, normally set up for batch processing, will automatically switch over to on-line service with any malfunction of the prime on-line unit assuring continuous on-line operation.

A key element in the proper execution of a buy or sell order is matching the order with a report of its execution on the floor of the stock exchange. The manual method generally used in Wall Street is susceptible to a variety of errors because pieces of paper are passed through many hands.

Hornblower's new automated system accomplishes this process in split seconds and eliminates the possibility of human error.

At Hornblower, a buy or sell transaction begins when one of the firm's registered representatives receives a customer's order in a branch office. It is transmitted by Teletype to the com-

puters at Hornblower's Automation Center where this buy and sell information is automatically condensed and stored.

From the minute the order is placed in the branch office and received at its destination, it never leaves the computer system.

All information permanently stored in the system is available for immediate call-up on a Control Data display at the center.

The computer routes each customer's orders to the nearest booth on the floor of the right exchange, and notice of the execution, including the opposing broker's identification, is transmitted to the computer.

The execution notice is then matched exactly by the computer to the orders it has on file. A report message is routed to the originating branch office. The basic data is retained within the computer for floor processing.

The computer will not process inaccurate orders, which are automatically queued for display on a CDC Model 210 CRT terminal in the automation center.

Here, corrections are made on the display screen and the message is entered as corrected.

The computer establishes a path for each customer order based on the context of the message and previously stored information on each security, including the exchange where it is traded.

## Burroughs Shows Record Sales EDP Orders Rose 46% Over 1968

DETROIT — Burroughs has reported record earnings, revenues, incoming orders, and backlogs for the six-month period ending June 30, 1969.

Ray W. Macdonald, president, said worldwide orders for the six-month period were a strong 20% above the same period last year.

Incoming orders for commercial products and services were up 27%; and while new government contracts have increased considerably since the March quarter, they have not yet equaled last year's six-month position.

He also noted that orders for the adding machine and calculating and accounting machines product areas were notably strong with orders exceeding last year's six-month position by 15%.

Incoming orders for electronic data processing products and systems, including central sys-

tems, peripheral devices, and terminals, continued at high levels for the six-month period and were 46% ahead of the same period in 1968.

Macdonald expressed the opinion that the unbundling program (separate financing of hardware and services) that Burroughs started in February, 1969, favorably influenced the first six-month incoming order position.

Macdonald further indicated that total worldwide backlogs continued to grow and are currently 26% greater than at the beginning of the year.

### Financial Breakdown

Indicated net operating earnings for the six-month period were \$20,665,000, a 31% increase over the 1968 operating earnings of \$15,746,000.

Net earnings per share were \$1.25 based on 16,525,113 average shares outstanding.

Earnings per share for the 1968 six-month period were 96 cents on 16,404,320 average shares outstanding. The shares outstanding for both periods are based on the stock split effective March 28, 1969.

Estimated U.S. and foreign income taxes for the six months were \$22,380,000, compared with \$15,750,000 in the 1968 period.

Revenue for the six-month period totaled \$351,298,000, a 17% increase compared with \$299,210,000 in the 1968 period.

Second-quarter net earnings were \$13,058,000, or 79 cents per share. This is a 31% increase over the 1968 second-quarter earnings of \$9,975,000, or 61 cents per share.

Revenues for the quarter were \$188,223,000, a 19% increase compared with last year's second-quarter revenue of \$158,814,000.

## IBM's per Share Earnings Up; Outright EDP Sales Decline

ARMONK, N.Y. — For the six months ended June 30, 1969, worldwide consolidated net earnings of IBM were \$443,476,846 after taxes, Thomas J. Watson Jr., chairman, reported.

Earnings per share were \$3.91 on the 113,277,205 shares outstanding. This compares with net earnings after taxes for the corresponding 1968 period of \$386,173,580, equivalent to \$3.43 per share on the 112,594,026 shares outstanding June 30, 1968.

Net earnings before taxes amounted to \$941,226,846 compared with \$821,673,580 in the corresponding period of 1968.

Consolidated gross income for the six months ended June 30, 1969, amounted to \$3,516,384,765 compared with \$3,160,725,743 in the corresponding 1968 period.

In his letter to stockholders, Watson said, "IBM's data processing business is primarily rental, and outright sales of data processing equipment, unlike

rentals, increase current income at the expense of future periods.

"Accordingly, a high level of purchase activity followed by a marked decline can create abnormally favorable income comparisons followed by less favorable ones.

"During the year 1968, IBM's gross income and earnings showed abnormally high rates of growth, primarily because of a major increase in the level of outright sales of data processing equipment.

"Although total gross income

and net earnings for the first six months of this year increased 11.3% and 14.8% respectively over the first six months of last year, the proportion of outright sales in our total volume for the first six months of 1969 was lower than that experienced in the comparable period of 1968.

"We believe this lower but more normal level of purchase activity is likely to continue and should this happen, income comparisons for future 1969 reporting periods will be less favorable than those experienced so far this year."

## IBM Sues Cogar Corp. in Attempt To Stop Use of 'Trade Secrets'

WHITE PLAINS, N.Y. — IBM is charging piracy. The small company being sued countercharges that IBM is attempting to "enforce servitude on IBM technical personnel."

IBM is seeking an injunction to prevent Cogar Corp. from using confidential IBM information. Sixty-six employees, half of

Cogar's work force, have left IBM since November, 1968.

The IBM complaint states that IBM manuals, specifications, and drawings containing trade secrets or proprietary information have been converted to Cogar Corp. use, and that Cogar has solicited contractors who make trade-

(Continued on Page 18)

## RCA Domestic Computer Bookings Climb 36% in Period

NEW YORK — RCA sales and earnings rose to new all-time records in the first half of 1969, continuing the longest period of sustained growth in the company's fifty-year history, according to Robert W. Sarnoff, president.

Sarnoff, in a recent release, said RCA was responding to an increasingly competitive environment by sharpening its marketing techniques and strengthening its marketing organization at both corporate staff and operating division levels.

The results of this new orientation, he added, are becoming apparent through improved performances in divisions such as Information Systems where RCA anticipates its major growth in the 1970s.

He said domestic bookings of computer systems in the first half of 1969 were 36% above the same period last year and the division had exceeded its goal for new orders in every month of the past six.

"We are centering our market thrust in those areas of

greatest growth potential — time-sharing and computer communications," he said. "I am confident this effort will give RCA a major new profit center early in the next decade."

### Profit Details

Net profit for the six months ended June 30 rose 5% to \$66.7 million from \$63.5 million a year earlier. Second-quarter earnings increased by 4% to \$25.9 million from \$24.8 million in the comparable 1968

period.

First-half sales were \$1.53 billion, up \$52 million from a year earlier, while volume for the second quarter advanced to a record \$761.2 million from \$720.7 million in the three months ended June 30, 1968.

Earnings per common share in the first half also rose 5% to \$1.02 from 97 cents the year before.

For the second quarter, per-share earnings were 39 cents, compared with 37 cents in the comparable 1968 period.

## Other Sectors Continue Down

## Computer Systems Struggles Up

By A.D. Williams  
CW Staff Writer

Only one company looked good the week ending July 18—and that was Astronaut Inc. which completed its primary venture of landing on the Moon. Unfortunately the only CW sector reflecting any upward trend was Computer Systems, which posted only a minor increase of less than 1%.

All other sectors reflected the opposing trend and went down. With all the current talk of

tight, very expensive money (federal funds selling at 10-3/4%), it seems a wonder any new financing is being accomplished. The new issues market has slowed down a good deal, but is showing, however, an occasional welcome sign of increasing quality.

"Speculate" is still the big word in this market, and always will be, new issues being what they are. A number of prospectuses we've seen recently offer demonstrable new hardware

products. Some are not in production because many new issues are intended specifically to provide the cash to start production.

A number of non-hardware prospectuses describe new, perhaps unique, approaches to very tough problems, such as interesting, economic ways of handling very large data banks.

The glamor has, at last, worn off mere phrases (we have in mind "time-sharing").

It takes more than just being "the only Fortran or Basic time-sharing service in Podunk" to make things go, earnings-wise.

And, more seriously, it cannot be comfortable to use new money to pay off back hardware rentals.

A great many people (promoters included) are easily swayed by the not-too-many-shares, low-price-per-share, "how much of \$4 per share can you lose, anyway" reasoning.

We can't, ourselves, wait to save enough money for even a couple of shares of IBM, much as we'd like to.

We just hope, sometimes, to be lucky enough to pick a well-promoted new issue, or better, a company that has genuine talent, management, and something better, product-wise.

## IBM Sues Cogar

(continued from Pg. 17)

secret apparatuses for IBM to manufacture such equipment for Cogar.

George R. Cogar, company president, charged that the suit "appears as an attempt to create and enforce servitude on IBM technical personnel." He added that "this unrealistic action will be vigorously defended, and our attorneys are evaluating a counterclaim against IBM."

George Cogar has faced this problem before. He left the Univac Division of Sperry Rand in 1964 to help form Mohawk Data Sciences Corp. But Sperry sued, charging that he had taken trade secrets with him. In 1966, the parties settled out of court, and Mohawk agreed to pay Sperry \$200,000 over five years.

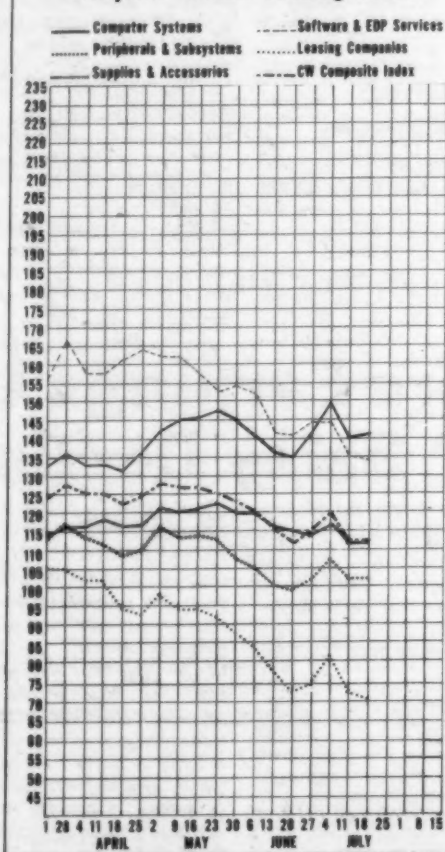
At Mohawk, Cogar said he "conceptually created, engineered, and prepared for marketing" the firm's data recorder line. Last year, he left because of disagreement as to corporate direction. He stated that he was opposed to Mohawk's aggressive acquisition plan.

Cogar claims that both the Sperry and IBM suits have "no basis in fact" and that the Sperry suit was settled only because Mohawk was in the middle of registration and in a vulnerable position.

Cogar Corp. is planning to produce a family of monolithic semiconductor memory systems. They have no orders as yet, and have no definite plans for production.

IBM said the "full purpose" of the suit was to protect against misuse of trade secrets. Any implication of any other purpose is wholly without foundation, IBM said.

## Computer Stocks Trading Index



## Unbundling: What's its impact?

The factual details of IBM's unbundling announcement have been well reported. But what are the key economic impacts on software companies, leasing firms, service bureaus, users, etc? EDP Industry Report's current issue analyzes these impacts, and projects their size and consequences.

EDP Industry Report, "the gray sheet", is generally regarded as the most authoritative source of market facts and figures on the \$12 billion-a-year computer industry. Its twice-a-month issues provide subscribers with facts, ideas and insights on the computer market. Its well-researched contents have enabled it to become one of the most-quoted publications in the EDP field.

EDP/IR is published 24 times a year by the International Data Corporation, the largest market data gathering, analysis, and publishing company in the computer and information processing industry. Subscriptions \$75 per year. Free copy of annual Review and Forecast issue sent with pre-paid subscriptions. Write:

EDP Industry Report  
Department K  
60 Austin Street  
Newtonville, Mass. 02160

COMPUTER STOCKS:  
TRADING SUMMARY

WEEK ENDED JULY 18, 1969

COMPUTER SYSTEMS				WEEK	WEEK
EXCH	1969	CLOSING		NET	%
	RANGE	PRICE		CHANGE	CHANGE
N	141-120	134 3/4	BURROUGHS CORP	+ 5	3.85
N	69- 44	47 1/2	COLLINS RADIO	+ 3/4	1.60
N	159-125	141 1/2	CONTROL DATA CORP	- 2 1/4	-1.57
A	72- 56	65 3/4	DIGITAL EQUIPMENT	+ 3 3/4	6.05
N	25- 15	16 1/2	ELECTRONIC ASSOC.	- 5/8	-3.65
N	98- 84	87 1/4	GENERAL ELECTRIC	+ 7/8	1.01
N	95- 75	83 1/4	HEWLETT-PACKARD CO	- 1	-1.19
N	140-107	128 1/8	HONEYWELL INC	- 2 1/4	-1.73
N	354-291	323	IBM	- 8 1/2	-2.56
N	139-108	125 1/4	NCR	- 5	-3.84
N	40- 38	40	RCA	+ 3/8	.95
N	50- 30	33	RAYTHEON CO	---	---
O	43- 24	34	SCI. CONTROL CORP.	+ 1	3.03
N	55- 44	52 1/2	SPPRY RAND	+ 1/8	.24
A	36- 26	33 5/8	SYSTEMS ENG. LABS	+ 7/8	2.67

PERIPHERALS & SUBSYSTEMS				WEEK	WEEK
EXCH	1969	CLOSING		NET	%
	RANGE	PRICE		CHANGE	CHANGE
N	82- 65	69 1/4	ADDRESSOGRAPH-MULT	- 1/4	-.36
O	71- 19	19 3/4	ALPHANUMERIC	- 3/4	-3.66
N	44- 32	43	AMPEX CORP	+ 3/4	1.78
O	19- 11	11 3/4	BOLT, BERANEK & NEW	+ 1/4	.17
N	17- 10	10 7/8	BUNKER-RAMO	- 1/8	-1.14
A	37- 25	25 1/2	CALCOMP	- 2	-7.27
O	38- 23	23 3/4	COGNITRONICS	+ 1/4	1.06
A	16- 9	10	COMPUTER EQUIPMENT	+ 1/8	1.27
A	27- 13	15 5/8	DATA PRODUCTS CORP	+ 1/8	.61
O	22- 13	17 1/2	DIGITRONICS	- 1/4	-1.41
O	62- 46	49 3/4	ELECTRON MEMORIES	- 1 3/4	-3.40
O	17- 9	9 1/8	FARRINGTON MFG	- 5/8	-6.41
O	37- 20	21 1/2	FARRINGTON MFG	- 1/2	-2.27
O	21- 11	12	INFORMATION DIS	+ 1/2	4.35
A	34- 20	24	MILCO ELECTRONICS	+ 7/8	3.78
A	87- 59	78 7/8	MOHAWK DATA SCI.	+ 1 1/4	1.61
O	118- 54	66	OPTICAL SCANNING	+ 3	4.76
O	31- 18	18	PHOTON	- 1/2	-2.70
A	35- 23	26 3/8	POTTER INSTRUMENT	+ 1/8	.48
O	76- 54	63 1/2	RECOGNITION EQUIP	- 1 1/2	-2.31
A	22- 18	18	RIXON ELECTRONICS	---	---
N	61- 26	26 1/2	SANDERS ASSOCIATES	- 1 5/8	-5.78
O	85- 39	40	SCAN DATA	- 5	-11.11
O	36- 17	18	TALLY CORP.	+ 1/2	2.86
N	100- 85	93	XEROX CORP	+ 7/8	.95

SUPPLIES & ACCESSORIES				WEEK	WEEK
EXCH	1969	CLOSING		NET	%
	RANGE	PRICE		CHANGE	CHANGE
O	47- 32	36	ACME VISIBLE	---	---
N	22- 12	13 7/8	ADAMS-MILLIS CORP	- 3/8	-2.63
O	27- 23	24 1/4	BALTIMORE BUS FORM	+ 1/4	1.02
A	29- 18	20 1/2	BARRY WRIGHT	+ 3/4	3.85
O	44- 29	30 1/8	DATA DOCUMENTS	+ 3/8	1.26
N	42- 33	33	ENNIS BUS. FORMS	- 1 3/4	-5.04
N	89- 65	81 1/2	MEMOREX	- 2	-2.40
N	112- 94	105	3M COMPANY	+ 2 7/8	2.82
O	37- 29	31 1/2	MOORE BUS FORMS	+ 1/4	-.79
N	46- 36	39 7/8	NASHUA CORP.	---	---
O	48- 30	30 1/2	REYNOLDS & REYNOLD	- 2 1/2	-7.58
O	31- 23	27 1/2	STANDARD REGISTER	+ 1/2	1.85
N	36- 28	32	UARCO	- 1 1/2	-4.48
A	20- 13	14 1/2	WABASH MAGNETICS	---	---
O	34- 29	30 1/2	WALLACE BUS FORMS	- 1 3/4	-5.43

SOFTWARE & EDP SERVICES				WEEK	WEEK
EXCH	1969	CLOSING		NET	%
	RANGE	PRICE		CHANGE	CHANGE
O	14- 6	6 3/4	ADVANCED COMP TECH	- 1/2	-6.90
O	39- 29	32 1/2	APPLIED DATA RES	- 1 1/2	-4.41
O	19- 7	7	ARIES	- 1/2	-6.67
A	83- 63	76 1/4	AUTOMATIC DATA PROC	- 7/8	-1.13
O	13- 7	8	AUTO SCIENCES	- 1/2	-5.88
O	17- 10	10 1/2	BRANDON APPL SYS	- 1/4	-2.33
A	21- 13	13 1/8	COMPUTER APPL	- 5/8	-4.55
O	16- 6	6 3/4	COMPUTER ENVIRON	- 3/4	-10.00
O	47- 27	27	COMPUTER NETWORK	- 4	-12.98
N	30- 23	25 7/8	COMPUTER SCIENCES	- 1/8	-.48
O	40- 16	16	COMPUTER USAGE	- 1/2	-3.03
A	56- 37	45 5/8	COMPUTING & SOFT	+ 5/8	1.39
O	24- 7	7 1/2	DATAMATION SERVICE	- 3/4	-9.09
O	17- 8	9	DATATAR	---	---
O	15- 6	7 1/2	DICITEK	- 3/4	-9.09
A	38- 16	17	ELECT COMP PROG	- 5 1/4	-23.60
O	38- 28	24 1/2	INFORMATICS	+ 2 3/4	12.64
O	19- 3	---	MATRIX CORP.	---	---
O	22- 8	8 1/2	NAT COMP ANALYSTS	- 1/2	-5.56
A	33- 23	30	PLANNING RESEARCH	+ 1 3/8	4.80
O	11- 7	7 1/2	PROGRAMMING & SYS	- 3/4	-9.09
O	10- 6	---	SOFTWARE SYSTEMS	---	---
O	37- 6	6	STRATEGIC SYS	- 1/2	-7.69
O	36- 11	20	TBS COMP CENT INC.	- 2 1/2	-11.11
O	12- 5	5 1/2	UNITED DATA CENTER	---	---
O	155- 67	67	UNIVERSITY COMP	- 2	-2.98
O	38- 22	---	URS SYSTEMS	---	---
O	16- 9	9 1/4	U.S. TIME-SHARING	---	---

LEASING COMPANIES				WEEK	WEEK
EXCH	1969	CLOSING		NET	%
	RANGE	PRICE		CHANGE	CHANGE
O	45- 25	30	BOOTH COMPUTER	---	---
O	18- 6	6 1/2	COMPUTER EXCHANGE	---	---
A	34- 10	12 1/2	COMPUTER LEASING	---	---
O	14- 8	12	CONT COMPUTER	- 7/8	-6.80
O	12- 8	9 1/4	CYBER-TRONICS	- 1/4	-2.63
A	68- 28	30 1/2	DATA PROC. F & G	- 1 1/2	-4.69
O	16- 7	7 1/4	DATRONIC RENTAL	+ 1/4	3.57
A	52- 36	43 1/2	DEARBORN COMPUTER	+ 2 1/2	6.10
O	18- 10	11 1/2	DPA, INC.	+ 1/4	2.92
A	45- 21	22 5/8	GRANITE EQUIPMENT	- 3 3/4	-14.22
A	28- 14	15	GREYHOUND COMPUTER	- 7/8	-5.51
N	139- 27	28 1/4	LEASCO DATA PROC.	- 7/8	-3.00
O	9- 5	5	LECTRO COMP LEAS	---	---
A	57- 27	30	LEVIN-TOWNSEND CMP	+ 5/8	2.13
O	8- 4	4 1/2	LWC DATA, INC.	- 1/4	-5.26
O	14- 5	5 1/2	MANAGEMENT ASSIST	- 1/4	-4.35
A	39- 26	26 3/4	NATIONAL EQUIPMENT	- 1 1/4	-4.46
O	12- 6	6 3/4	NCC LEASING	- 1/4	-3.57
O	43- 21	23 1/8	RANDOLPH COMPUTER	- 1/8	-.54
O	34- 9	9 1/4	SYSTEM CAPITAL	+ 1/4	2.78
A	28- 13	16 1/2	U.S. LEASING	+ 3/4	4.76

## Franchiser Orders \$10 Million of H1648

FRAMINGHAM, Mass. — National Computer Franchise Corp. in Chicago plans to purchase 20 H1648 time-sharing computer systems valued at \$10 million, according to Honeywell.

NCFC will use the computers from Honeywell's computer control division here to set up franchised time-sharing centers in 20 major cities in the U.S.

The first center is expected to be operating in Chicago by July 1, according to Ronald L. Fenton, NCFC president. The franchising company will offer a complete package of training, hardware, and software to franchisees who will provide time-sharing and batch-processing services to their customers.

Deliveries are scheduled through mid-1971.

The Salt River Project Board of Governors of Phoenix, Ariz., has awarded a contract in excess of \$1 million to Gulton Industries, Inc. for supervisory control of the project's water system. The supervisory control system, which supplies water to the Phoenix area, will consist of five phases and will be installed by Gulton's data system division, Albuquerque, N.M.

Dataram Corp. of Princeton, N.J., has received a \$750,000 contract from Potter Instrument Corp. to supply memory systems for use in Potter's KDR series of key-to-tape peripheral equipment. Dataram designs and manufactures ferrite core memory planes and stacks and other

## Contracts

memory products for data processing applications.

Computing and Software, Inc. of Los Angeles has received a one-year contract valued in excess of \$700,000 from Nasa. It provides for the continuation of scientific computing services at Nasa's Langley Research Center, Hampton, Va. The contract involves operational support of research data processing and document conversion services in conjunction with major space, aeronautical, and basic research projects at the center.

Informatics, Inc. of Bethesda, Md., has received a \$445,158 contract from the Department of Housing and Urban Development. It is expected to result in the implementation of new management systems facilitating HUD operations nationwide. All work will be coordinated through Informatics' Eastern Operations Office.

Florida Software Services, Inc. of Orlando, Fla., has been awarded a contract to develop and implement a series of computerized application systems and to assist in systems analysis and programming support for

the data processing division of Combanks Corp., a Florida data center.

The award of a contract has been made by Dun & Bradstreet to Informatics, Inc. of Sherman Oaks, Calif., for a new, expanded, computerized message-switching center at D&B's New York headquarters. The center will increase the message capacity of the existing D&B communications network from a current capability of over 6,000,000 messages annually to an eventual total of more than 60,000,000 in time.

Computer Usage of Greenwich, Conn., has been awarded a contract by the Applied Physics Laboratory of Johns Hopkins University to develop, checkout, and test programs in Polaris missile telemetry. The programs will be developed for the IBM 360 Model 91 and the SEL 840A and 840MP computers. Work on the \$10,000 contract will last about 10 weeks.

Sanders Associates, Inc. of Nashua, N.H., has received an award from the Link Division of Singer General Precision Corp. for an Adds/900 system that will provide the display and closed-circuit television portion of Link's new synthetic flight-training system for training four helicopter pilots simultaneously. The Adds/900 system will perform with a central computer and four electro-mechanical training mounts monitored by an instructor.

## Acquisitions

Stockton Data Processing Center will be acquired by Computer Time Sharing Corp. of Palo Alto, Calif., under terms of an agreement in principle through a transfer of stock. The Stockton firm, a service center providing commercial data processing services to customers in the San Joaquin Valley area, will operate as a part of CTC's data systems division.

Com-Share, Inc. of Ann Arbor, Mich., has acquired the time-sharing division of Data Central, Inc. of Clayton, Mich. The deal has a total value of \$1,000,000 to Data Central.

Automatic Data Processing, Inc. of Clifton, N.J., has completed the previously announced acquisition of Tabulating Services, Inc., a privately owned, Pittsburgh-based, data processing firm. The acquisition was made for an undisclosed amount of stock and will be accounted for on a pooling-of-interest basis. Current management will remain, and the new subsidiary is to be known as Automatic Data Processing of Pittsburgh, Inc.

EDP Technology, Inc. of Washington, D.C., and SysMed Corp. have reached an agreement in principle for EDP to acquire SysMed for an undisclosed amount of stock, subject to the approval of the boards of directors of both companies and the stockholders of SysMed. EDP

develops systems and techniques for applications of computer technology to problems in education, health, community planning, and other areas. SysMed is engaged in the application of advanced technologies and management techniques to the health-care field.

Information Industries, Inc. of Wayne, Pa., and Engineering Inc. of Newark, N.J., are in active negotiations concerning the acquisition by Information Industries of Robert Heller Associates, Inc. of Cleveland, a consulting firm presently wholly owned by Engineering, Inc.

H.J. Gruy and Associates, Inc. a Dallas-based petroleum consulting firm, has been acquired by Computer Utilization, Inc. for all their capital stock and an undisclosed consideration. Gruy Associates is engaged in the field of reservoir engineering and will continue autonomous operations with no changes in present management.

Tax Corporation of America, Washington, D.C., has agreed to acquire Allstate Title Co. of Los Angeles for the exchange of an undisclosed amount of stock. Allstate Title offers title-search operations on a computerized basis; TCA will integrate the Allstate Title service into its offering of a full range of computerized services.

## Earnings Reports

### AMPEX CORP.

Year Ended April 27

	1969	1968
Shr Ernd	\$1.35	\$0.80
Revenue	296,319,000	233,433,000
Earnings	13,702,000	7,665,000

### CYBER-TRONICS, INC.

Year Ended April 30

	1969	a1968
Shr Ernd	\$2.26	
Total Incm	12,900,822	12,674,069
Earnings	430,865	58,316

a—Restated with the acquisition of Hackett Corp. in fiscal 1969 on a pooling-of-interest basis.

### GRAPHIC SCIENCES, INC.

3 Months Ended March 31

	a1969	b1968
Revenue	\$861,100	
Loss	789,045	

9 Months Ended March 31  
Revenue 1,612,740  
Loss 754,546

a—The company says that it became revenue-producing with respect to graphic communications systems during January, 1969. Prior to Jan. 1, 1969, costs directly related to this activity had been directed deferred; commencing on this date, such cost amortization of the deferred start-up costs was started Feb. 1, 1969; b—Comparable figures are not available since the company's principal activity was in the development stage.

### GRANITE EQUIPMENT LEASING

3 Months Ended May 31

	1969	b1968
aShr Ernd	\$2.25	c\$2.22
Revenue	6,217,000	2,957,000
Spec Cred		e9,000
Earnings	501,000	f334,000

a—Based on income before special credit; b—Restated by company; c—Adjusted to reflect 3% stock dividend payable Aug. 18, 1969; e—Represents tax-loss carry forward; f—Equal to 23 cents a share.

### CONTINENTAL COMPUTER ASSOCIATES

Year Ended March 31

	a1969	1968
Shr Ernd	b\$2.25	\$1.14
Gross Rev	9,234,537	2,700,751
Earnings	459,266	186,990

a—Includes operations of Banister Pipeline Companies acquired Jan. 7, 1968; b—On a fully diluted basis, earnings per share, as reported by company, were 23 cents.

### MITE CORP.

12 Weeks Ended May 23

	1969	1968
Shr Ernd	\$1.10	\$0.07
Revenue	3,486,000	2,474,000
Earnings	206,667	136,000

### URS SYSTEMS CORP.

26 Weeks Ended May 2

	1969	a1968
Shr Ernd	\$3.30	
Revenue	8,477,000	
Earnings	433,000	

a—Comparable figures not available.

### ELECTRONIC ASSISTANCE

3 Months Ended April 30

	1969	a1968
Shr Ernd	\$0.08	\$1.13
Revenue	5,573,000	5,416,000
Earnings	159,000	229,000

a—Adjusted to reflect acquisition of Welco Industries Inc and Monterey Mfg. Co. on a pooling-of-interest basis.

### GERBER SCIENTIFIC INSTRUMENTS

Year Ended April 30

	1969	1968
Shr Ernd	\$7.77	b\$5.2
Revenue	9,132,810	8,102,400
Earnings	765,914	468,543
aAvg Shrs	992,781	b895,763

a—Includes common stock equivalents; b—Adjusted for two-for-one stock split in October, 1968.

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# 15 OTC Stocks Now Tagged With Margin Requirement

WASHINGTON, D.C. — The Federal Reserve Board has added 290 over-the-counter stocks that will be subject to the same margin rules as apply to the national exchanges. Fifteen stocks are computer industry related.

These requirements call for a buyer to put up a cash down payment, or margin, of 80% of

the purchase price of the stock. Congress authorized the addition through legislation last year, as a step to curb speculation.

The 15 computer-related stocks are:  
Bolt, Beranek & Newman Inc.  
Cognitronics Corp.  
Computer Usage Co.  
Continental Computer Associates Inc.  
DPA Inc.

Disc Inc. (Class A common, par value \$1)  
Fabri-Tek Inc.  
Graphic Controls Corp.  
Magnetics Inc.  
Photon Inc.

Recognition Equipment Inc.  
Scientific Control Corp.  
Tracor Inc.  
University Computing Co.

Wallace Business Forms Inc.

and systems paid a 100% stock dividend in January.

## Universal Electronics Gives Slent as Dividend

HOUSTON — Universal Electronics Corp. has announced a dividend of four shares of Slent Computer Corp. stock for each 100 shares of Universal Electronics held as of record July 3 and payable July 27, 1969.

Universal has about 5,900,000 shares outstanding and will retain about 25,000 shares of Slent following the dividend distribution, according to Universal Chairman Darvin Watson. Slent has approximately 2,000,000 shares outstanding.

Slent, a three-year-old, Houston-based computer software firm, projects revenues of about \$780,000 for the current year, with anticipated earnings of \$110,000 after taxes. In addition to its computer services, the company has franchised offices in some five states and also conducts classes in programming and computer services.

## C & S Stockholders Approve Executive Stock Plan

LOS ANGELES — In a special meeting, Computing and Software Inc. shareholders have approved a new restricted stock plan for key executives of the corporation.

"This new stock plan, which represents a maximum of 4% of our common stock, provides additional incentive to principal Computing and Software executives to remain with the corporation and to contribute to our continued growth," indicated President Norman E. Friedmann.

"In addition, the plan will serve to attract additional competent and qualified executive personnel."

## Transistor Electronics Declares Cash Dividend

MINNEAPOLIS, Minn. — The board of directors of Transistor Electronics Corp. has declared a cash dividend of 10 cents per common share, payable Aug. 8, 1969, to shareholders of record July 9, 1969.

There are 675,908 shares of common stock issued and outstanding.

The manufacturer of electronic data display and control devices

## Sanders Declares Dividend

NASHUA, N.H. — The regular quarterly dividend of 7.5 cents per share has been declared by the board of directors of Sanders Associates, Inc. The dividend is payable July 16 to stockholders of record July 8.

Company President Royden C. Sanders Jr. stated that the company is continuing investment to expand further all its systems technologies to assure profitable future growth in the commercial and military markets.

In commenting on the company's rapidly expanding commercial activities, Mr. Sanders said that the computer data systems and equipment market will be as large in the future as that of the mainframe computer itself. "Our commercial orders, sales, and backlog rose sharply during the first nine months of the fiscal year, and our commercial operations have now moved into a modest profit position," he reported.

## New Registrations

COMPUTER MODEM CORP., 2500 Lemoline Ave., Fort Lee, N.J. 07024, a company engaged in the design, development, and marketing of a digital communication device to be used in conjunction with transmission lines, filed to register 200,000 shares of a common stock and 80,000 common stock purchase warrants.

Proceeds, at \$12.50 per unit maximum (each unit consisting of five shares and two warrants), intended for the purchase of equipment, for sales and promotion of products, for consulting fees, for fees relating to research and product promotion, and for salaries for two years. The underwriter is Kluger, Ellis & Mann, New York, N.Y.

TRACOR COMPUTING CORP., 1705 Guadalupe St., Austin, Texas 78701, a company that operates medium-scale computers and offers services such as systems consulting and design, programming, systems management, and traditional service bureau activities, filed to register 2,310,000 shares of common stock. Proceeds, at \$2 per share, intended to repay short-term loans and to finance engineering, marketing, and general administrative expenses. No underwriter is involved.

COMPUTING CORPORATION OF AMERICA, INC., 3385 S. Bannock St., Denver, Colo. 80223, a company that provides comprehensive software, consulting, and computer equipment and systems sales to computer users, filed to register 90,000 shares of common stock.

Proceeds, at \$8 per share, intended for general promotion and advertising and for establishment of four branch offices. No underwriter is involved.

ELECTRONIC MICRO SYSTEMS, INC., 1672 Kaiser Ave., Santa Ana, Calif., a company engaged in the design, development, and sale of electronic components, such as computer memory toroidal transformers and data acquisition systems, filed to register 70,000 shares of capital stock.

Proceeds, at \$5 per share, intended for additions to the company's general funds. The underwriter is Lomasney & Co., 67 Broad St., New York, N.Y. 10004.

COMPUTER TERMINAL CORP., 142 W. Rhapsody Drive, San Antonio, Texas 78209, a company engaged in the development of video computer terminal systems utilizing the simplified format of conventional teletypewriter equipment presently employed by most time-sharing users, filed to register 500,000 shares of common stock.

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HORN COMPUTER RESEARCH CORP., 233 Broadway, New York, N.Y. 10007, a company engaged in the development and preparation of computer-related materials for publication, filed to register 250,000 shares of common stock.

Proceeds, at \$2 per share, intended for the implementation and development of publications and for the promotion and marketing of cassette magnetic tape recordings of training materials. The underwriter is Dunhill Securities Corp., 21 West St., New York, N.Y. 10006.

INTERNATIONAL COMPUTER SERVICES, INC., 475 Commonwealth Ave., Boston, Mass. 02215, a company engaged as the exclusive marketing representative of the Call-A-Computer time-sharing computer system, filed to register 100,000 shares of common stock and 50,000 common stock purchase warrants. Proceeds, at \$10 per unit (each unit consisting of two shares and one warrant), intended to repay bank loans and to expand its time-sharing personnel and facilities. The underwriter is Chaim Gross, Brooklyn, N.Y.

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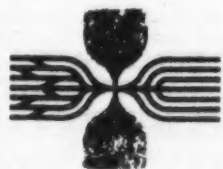
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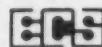
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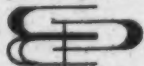
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